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A QUARTERLY INFORMATION BULLETIN FROM THE METHODOLOGY DIVISION

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New ABS Seasonal Adjustment Software Suit Release

New ABS Seasonal Adjustment Software Suit Release

SEASABS is a suit of seasonal adjustment software developed and used by the Australian Bureau of Statistics (ABS). After two years of additional development and enhancements, a new version (2.6) is planned to be released into the ABS production environment on 13 December 2006 and will be available to external users in early 2007. The new methodological features in this version include:

- Many enhancements to the graphic interface between U.S. Census Bureau's X-12-ARIMA and the ABS seasonal adjustment environment. The improved interface allows us to utilise X-12-ARIMA modelling capability to perform our annual seasonal adjustment analysis (or review).
- A new "Time Series Aggregation and Update" can perform both one and two dimensional seasonally adjusted reconciliations to maintain the additivity of all directly seasonally adjusted estimates based on their original estimate aggregation structure. Our new method is based on the principle of minimising changes to the directly seasonally adjusted level and movement while minimising the risk of introducing residual seasonality.
- A "General Backcasting Facility" which provides best estimate of backcast lengths and consistent backcast methods based on a smoothing back principle and determined by decomposition characteristics of the time series under study. This facility can be used for backcasting original estimates by taking account of measurement impacts induced by major methodological changes such as new estimation methods using Taxation data and the implementation of Australia and New Zealand System of Industry Classification (ANZSIC) 2006.

There are also many other improvements, enhancements and bug fixes from the previous versions.

For further information, please contact Melissa Gare on (02) 6252 7147.

Email : m.gare@abs.gov.au

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ABS to Enhance Operations Research Capacity

ABS to Enhance Operations Research Capacity

The ABS, like the rest of world, is operating in a more complex environment. Huge numbers of choices and relentless time and cost pressures make the decisions we face more daunting and difficult. Meanwhile, our systems are generating massive amounts of data about how we do our business. Are we taking advantage of this data to help us make good decisions? Are we gaining the most from our processes, the way we conduct surveys, determine our costs, evaluate benefits of new initiatives? What should we do differently and how should we do it?

The Operations Research Unit that has been established in the Methodology Division from 1 July 2006 is aimed at addressing these questions with the initial focus on Population Surveys Operations (PSO) and Economic Statistics Data Centre (ESDC). Operations Research (also sometimes referred to as Management Science or Decision Science) is a scientific approach to analysing problems and making decisions. Operations Research is interdisciplinary - it uses mathematics and mathematical modelling on computers to forecast the implications of various choices and discover the best alternatives by drawing on solutions from engineering, logic, psychology, and other social and political sciences.

For more information, please contact: Dina Neiger on (03) 9615 7977.

Email : dina.neiger@abs.gov.au

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Proceedings of the 55th Session of the International Statistical Institute now available

Proceedings of the 55th Session of the International Statistical Institute now available

Last year the ABS hosted the 55th Session of the International Statistical Institute in Sydney. The conference was very successful, with the final scientific program for the session including over 200 meetings, 1000 talks and over 1800 participants. Presentations at the ISI Session and its associated meetings and short courses covered a range of significant areas in the statistics field. Special theme days, with cutting edge presentations and papers, were held in the areas of Finance and Statistics, Environmental Statistics and Genomics. Highlights of the Session included talks by renowned mathematical biologist Lord Robert May, and econometrician and Nobel Laureate Sir Clive Granger.

The production of a set of proceedings following the Session was a major job in its own right and involved many ABS and MD staff. During the Session, MD staff attending acted as assistants or "Yellow Shirts" as they were fondly referred to - since they were clothed in highly noticable yellow shirts which made them recognisable to participants and staff at the convention centre. The Yellow Shirts acted as points of information for participants and also were responsible for keeping attendance and presentation records of each meeting, to ensure that the proceedings would include only those papers actually presented at the conference.

After the session, the Local Program Committee began the task of collecting and collating papers, discussion papers and presentation slides. The final proceedings contain over 1500 files which were all required to be indexed and linked. The ABS Marketing section produced the graphic design for the CDRom artwork.

The ABS also arranged for selected sessions in the scientific program to be recorded, and produced an additional DVD in complement to the Proceedings

Proceedings CDRoms are available from desk 4N103.

For further information please contact Jayne McQualter on (02) 6252 7320.

Email: jayne.mcqualter@abs.gov.au

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Update on the Business Longitudinal Database

Update on the Business Longitudinal Database

The December 2004 issue MD News announced an undertaking by the Australian Bureau of Statistics (ABS) to create a Business Longitudinal Database (BLD) as a response to strong external demand for longitudinal statistics on business characteristics and performance. This database would consist of directly collected survey data from a sample of businesses on the Australian Business Register (ABR) and linked administrative records from taxation and trade sources. The sample would be split into five panels, with units selected in each panel remaining in the sample for five years and one panel being completely refreshed each year. This ensures that for any five year period there is a longitudinal panel for analysis and for periods less than five years there will be multiple panels available. Each panel would be stratified using Australian and New Zealand Standard Industrial Classification (ANZSIC) division by employment size and sample would be allocated to ensure that at the end of five years there would be approximately equal numbers of live responding units in each stratum.

Since that issue much progress has been made. The ABS received funding in the 2005 Budget to pursue the BLD and an associated Food Industry Survey. The design was accepted with a modification to stratify businesses involved in the Food Industry at a finer level and to direct extra sample to these businesses. The scope of the database has been finalised. It includes non-employers and 12 ANZSIC divisions but is currently restricted to businesses with employment less than 200. The content of the direct collection is made up of a set of core business characteristic questions covering employment breakdowns; business location, ownership and age; cooperative arrangements; information technology; innovation; research and development; trade status; markets and competition; financial and government assistance; and performance measurement. There are also detailed Information Technology and Innovation questions asked on alternate years. In addition to the panel-based BLD discussed here, the ABS is developing a large/sparse BLD. This will essentially involve the integration of all available (mainly administrative) data for all businesses in Australia, and will be used to produce thematic outputs.

The first of the panel samples was selected for the 2004/5 financial year reference period. Data has been collected, edited and is now being prepared for the Remote Data Access Laboratory (RADL) environment. This sample contains around 2,300 unique live responding businesses. It is envisaged that future panels will contain around 3000 unique live responding businesses at the time of selection and the combined five panel sample will be around 12,000 live respondents.

The scope of the current Survey on Business Use of Information Technology (BUI) and Innovation Survey overlap with the BLD and it has been decided to group these collections together under an Integrated Business Characteristics Strategy (IBCS). The BLD direct collect panel samples will provide the data for producing both the longitudinal database and the cross-sectional characteristic estimates currently output from BUI and Innovation. In the initial years before all panels have been selected there will be a top-up sample to ensure high quality cross-sectional estimates can be produced. There will also be a sample of businesses with employment of 200 or more and businesses in ANZSIC divisions currently included by BUI/Innovation but not in the scope of the panel samples. Once four panel samples are in operation it is expected a top-up sample will not be required to produce quality cross-sectional characteristic estimates but it may be necessary to include a sample of birth businesses.

The concept of a BLD is not new to the ABS. From 1994 to 1998 the ABS ran a Business Longitudinal Survey (BLS). The BLD will have learned from the BLS experience, particularly relating to the management of birth and death businesses. Restricting the longitudinal scope to businesses with less than 200 employees means many businesses with complex and fluid structures will be avoided. There is some challenging work underway to develop business rules for handling structural changes and cases where the unit on the ABR (Australian Business Number) does not have a one-to-one relationship with the data received from providers. Other methodological challenges that are currently being worked through in parallel with the 05/06 sample allocation and selection include:

- ensuring there is a large common sample between the historical BUI/Innovation collections and the IBCS sample, without violating regulations over how long businesses can be in sample for;
- determining the requirements for a top up of birth businesses and the extent to which under-representation can be catered for by weighting techniques;
- investigating how best to combine the panel and top-up samples to produce cross-sectional estimates and standard errors
- gathering information on the ways the data will be used so appropriate support mechanisms can be put in place
- determining how to model and treat non-response over time and across panels

For further information please contact Carl Mackin on (08) 9360 5250

Email: carl.mackin@abs.gov.au

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Macro Editing Workshop Held in September 2006

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The Editing Re-engineering Team was formed in 2003 to help business collections improve their editing practices and to provide tools to support them. This task is proving to be difficult and complex as editing is not an 'exact' science. For example, it is relatively simple to algebraically describe estimation techniques which can be applied to many different collections. Given an input file of microdata, estimation will transform them into estimates as specified. Editing, on the other hand, is less straight-forward.

Editing involves detection, resolution, and treatment. Firstly, anomalies must be detected. These can range from unit records through to estimates. Once an anomaly is detected, it must be determined whether some form of remedial action is required (resolution). The last step involves the application of the method chosen to treat the anomaly. The treatment will depend on the source of the problem which could be anything from erroneous source data, to incorrect or poor estimation or imputation, to problems in the data processing system, to incorrect auxiliary data, or even to badly defined concepts.

The editing team has developed a general editing framework which encompasses the editing of unit records (micro editing) through to the editing of estimates (macro editing). The framework and associated editing solutions need to fit within the evolving business collection end-to-end framework and infrastructure. The team's approach has been to progress the work via collaborative arrangements between the editing re-engineering, business collection, methodology, and IT areas. While progress is being made on the micro editing front, work needs to start on the macro editing front in order to integrate with the end-to-end progress. As a start, a workshop on macro editing was held in Canberra on 12 September 2006 involving all stakeholders.

Business collection areas presented graphical drill-down tools, macro editing reports and databases, ideas for future tools, and assessments of systems currently in use. Technical Services Division (TSD) staff presented sessions on SAS Business Intelligence and data visualisation tools. Methodology Division (MD) staff outlined an example of best practice macro editing for aggregates which involved a combination of subjective and objective detection techniques and interactive drill-down functionality. MD and TSD staff jointly demonstrated the use of graphics in macro editing using SAS Insight. Macro significance scores were used as the basis of the objective component while the interactive functionality of SAS Insight was utilised for the subjective component. The editing team led the two final sessions which aimed to:

- identify the key features required for future corporate macro editing tools; and
- establish main priorities for macro editing tools in preparation for a business case for the end-to-end Program Board.

Participants were asked to fill in a questionnaire indicating their preferences for various macro editing functionalities and system components. The feedback from these questionnaires and discussion at the workshop indicate that:

- a detection tool based on both objective and subjective methods received the highest importance rating;
- for the subjective aspect of the tool, areas want the flexibility to choose different ways to set up and display their data;
- editors must be able to dynamically drill down to resolve anomalous aggregates;
- it was essential that functionality existed to facilitate a compositional breakdown of aggregates, followed by rankings of the top contributors within these components;
- it was desired that errors at the unit level should be able to be corrected directly in Blaise;
- staff want to be able to see the impacts of macro editing changes in real time; and perhaps the most surprising result,
- there was a strong desire to have a tool to document the results of investigations or actions taken in respect of macro level anomalies.

For further information, please contact Lynne Bismire on (02) 6252 5644 for general editing re-engineering issues and the business case. For methodological issues, please contact Keith Farwell on (03) 6222 5889, and for computing and IT issues, please contact Cathie Guilfoyle on (02) 6252 5027.

Email: lynne.bismire@abs.gov.au; keith.farwell@abs.gov.au; cathie.guilfoyle@abs.gov.au

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Changes to Australian Economic Indicators Publication

Changes to Australian Economic Indicators Publication

Australian Economic Indicators (AEI cat. no. 1350.0) is one of the flagship publications of the Australian Bureau of Statistics and has recently changed its publication system. AEI had been published in Ventura for many years but has now moved to the ABS standard publishing package (PPW). The first edition published in PPW was the September 2006 issue, which was released on 31 August. In the new PPW format tables are now more spread-out with more white space and in tables both the annual and sub-annual data only shows three annual figures.

The change is the culmination of many months of work, with a new version of PPW being released early in 2006 specifically to handle the complexities of AEI, which is a large multi-subject publication that covers a range of data from all of the ABS major economic and labour force publications.

The change in publication system has made it easier to access AEI via the web. The webpage for AEI has also been updated, showing abbreviations, explanatory notes and also include a link to a new product which is a glossary of all terms used in AEI feature articles and tables. Future editions will include hyperlinks and mouse-over-text which will enable users to access the relevant definition as they view AEI.

The AEI tables are currently being reviewed and in the future AEI will have improved data visualisation on the web allowing users to look at broad level data or to data mine it more deeply. Future issues will have the ability for web users to access the ABS data cube of full length time series for all tables.

For further information please contact Jo Jackson on (02) 6252 6114

Email: jo.jackson@abs.gov.au

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About this release

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